

**TRICHOGRAMMA AUSTRALICUM GIRAULT (HYMENOPTERA:
TRICHOGRAMMATIDAE): REDESCRIPTION AND
LECTOTYPE DESIGNATION**

J. D. PINTO, E. R. OATMAN, AND G. R. PLATNER

Department of Entomology, University of California, Riverside 92521

Nagarkatti and Nagaraja (1979) summarized the history of the name *T. australicum*. The name was improperly applied to one of the most common Australasian species of *Trichogramma* by Nagarkatti and Nagaraja (1968). This error was first noted by Viggiani (1976) upon examination of a portion of Girault's material of *T. australicum*. It now appears that most previous references to *T. australicum* are instead assignable to *T. chilonis* Ishii.

We recently examined most of the series of *T. australicum* which Girault had before him at the time of his description, including the male syntype which Viggiani (1976) assumed to be lost. A designation of this male as lectotype and a redescription of *T. australicum* is presented below. All material examined is deposited in the Queensland Museum, Queensland, Australia. Girault's specimens are on glass slides and mounted in Canada Balsam. We have remounted the lectotype in Hoyer's medium.

Trichogramma australicum Girault

Trichogramma australicum Girault, 1912:109. Viggiani, 1976:182. Nagarkatti and Nagaraja, 1979:115.

Type information.—The original description of *T. australicum* was based on two females and one male. The male and only one female were listed as types by Girault. The male "captured by sweeping grass along the left bank of the Pioneer River, Mackay, Queensland," 15 October 1911, is herein designated as lectotype (Type No. Hy/801, Queensland Museum, examined). It is not clear which of the two females Girault considered a type. Contrary to his published statement, both are on separate slides bearing the Hy/801 type label. We have labelled the female from the "Mulgrave River, near Pyramid Mountain, Nelson (Cairns)," 25 November 1911, as paralectotype. Locale for the other female is not specified on its slide nor in Girault's original description. Other material, identified by Girault as *T. australicum*, also was examined by him at the time of his description. These are listed below.

Lectotype male.—Dusky black with scutellum, metanotum, and vertex bright orange-yellow (*vide* Girault, 1912). Legs distinctly lighter except hind coxae dark.

Antennae (Fig. 1f) with flagellum slightly curved, relatively short, 0.95 as long as hind tibia, 0.24 as wide as long, flagellar setae short, stout, relatively blunt apically, 50–55 in number, length of longest seta 1.44 as long as maximum width of flagellum.

Forewing (Fig. 1a) with vein tracts distinct, setae between tracts moderate in number, area between 4th and 5th tracts (i.e., the 2 tracts posterior to the RS_2) with 18 setae; longest seta on postapical margin 0.18 as long as maximum width of wing.

Hindwing (Fig. 1b) with only middle vein tract complete; anterior tract apparently absent; posterior tract composed of 5 widely spaced, short setae extending only to apical $2/5$ of wing.

Mesoscutellum with anterior pair of setae damaged, broken at extreme base but obviously much finer and presumably much shorter than posterior pair.

Genital capsule (Fig. 1d) relatively narrow, 0.36 as wide as long; dorsal expansion of gonobase (DEG) moderately narrowed apically, narrowing gradually, sides subsinuate, shallowly constricted at base, apex distinctly sclerotized; DEG and chelate structures (CS) both attaining 0.89 the length of genital capsule; median ventral projection (MVP) long, robust, distinctly pointed, almost at level of apex of DEG, attaining 0.84 the length of genital capsule. Aedeagus (Fig. 1e) 0.81 as long as hind tibia, apodemes relatively long, comprising 0.54 the length of entire structure (Fig. 1g).

Paralectotype female.—Badly damaged. Color as in male (*fide* Girault, 1912). Antenna (Fig. 1c) with funicular segments wider than long; 1st funicular segment 0.67 as long as wide; 2nd 0.80 as long as wide, their combined length distinctly less than that of pedicel. Ovipositor 1.22 the length of hind tibia (Fig. 1g).

Other material.—Girault (1912) identified 19 additional specimens as *T. australicum*, five of which were males. These were taken from the following Queensland locales: Nelson (5 females, 3 males); Mareeba (1 female); Herberton (2 females); Cairns (1 male); Innisfail (1 female); and Cooktown (5 females, 1 male). Eleven of these specimens, including two males, were examined in our study. Other material from Girault's collection were collected either after his description of *T. australicum* or were ambiguously labelled.

Substantial variation exists within the original series. Girault stated that one of the females from Nelson was distinctly lighter ("nearly uniformly yellow") than others. We also note that the length of the MVP varies. In the lectotype, its apex is clearly below that of the DEG and CS. In the male, probably collected from Cairns (labelled as from Innisfail in Girault's material), it attains the same level as both of these structures. Also, the entire genital capsule is somewhat narrower in this male (0.29 as wide as long). The genitalia figured by Viggiani (1976) shows a considerably shorter MVP

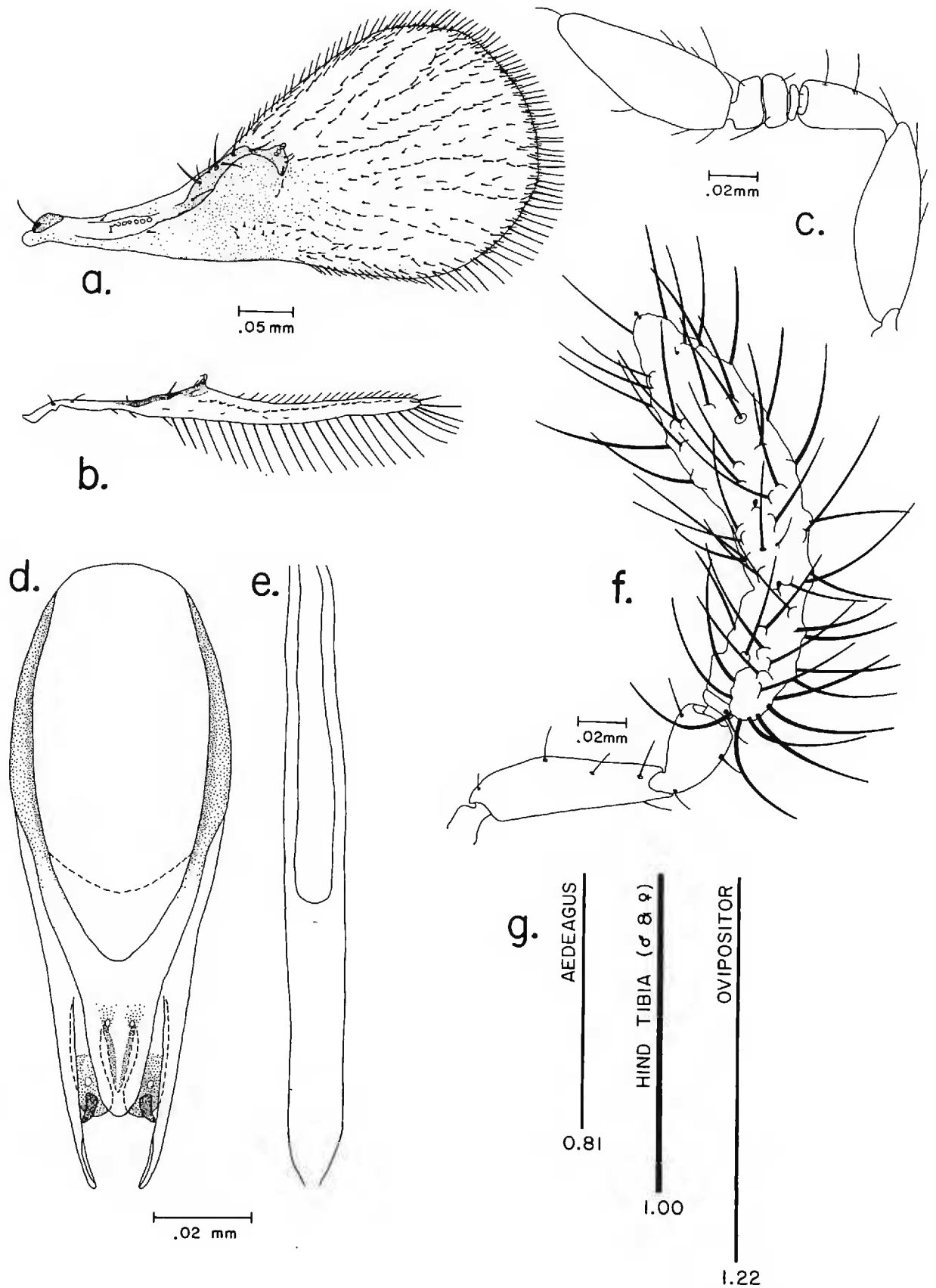


Fig. 1. *Trichogramma australicum*. a, b, d-g, lectotype ♂. c, g, paralectotype ♀. a, forewing. b, hindwing. c, ♀ antenna. d, genital capsule. e, aedeagus. f, ♂ antenna. g, ratio of ♂ + ♀ genitalia to hind tibia.

than occurs in the males examined by us. We have determined that the male examined by Viggiani was collected from Indooroopilly, 29 September 1920, and clearly was not a part of Girault's original series. Unfortunately, the condition of this specimen is not conducive to a comparison of other structures.

The flagellar setae of the lectotype are stout and short (longest seta 1.4 as long as maximum width of flagellum). Although the antennae of the other two males examined are shriveled, their setae are substantially finer and longer, with a corresponding ratio of ca. 1.9 in both.

In both females used by Girault in his original description, the ovipositor is ca. 22% longer than the hind tibia. It is only ca. 4% longer in all other females in his series.

Distribution.—Known only from Girault's original material collected at various locales in Queensland, Australia.

Remarks.—Males of *T. australicum* are most similar to those of *T. californicum* described by Nagaraja and Nagarkatti (1973) from northeastern California. The only differences we can detect in a comparison of the types of these species are the structure of the MVP and flagellar setae. The difference in the MVPs is minor. In *T. californicum*, the MVP is slightly more narrow than that in *T. australicum* (cf. Fig. 1d below and Fig. 10 in Nagaraja and Nagarkatti, 1973). The flagellar setae are longer in *T. californicum*. In *T. australicum*, the longest flagellar setae are 1.4 as long as the maximum flagellar width. Nagaraja and Nagarkatti (1973) state that in *T. californicum* they are "nearly twice" the maximum width. Our measurements on the holotype of *T. californicum* indicate that the flagellar setae are 1.7 as long as the maximum flagellar width, but the flagellum appears to have been abnormally inflated in preparation. Thus, the true value may be closer to 2.0. Certain other important characters, however, viz. hind wings, length of the aedeagus, and the nature of the mesoscutellar setae, cannot be compared because of the condition of material available for study.

The two females used in Girault's description of *T. australicum* are distinct from those of *T. californicum*. The funicular segments of the former are wider than long. They are typically quadrate in *Trichogramma* as they are in *T. californicum*. The only other females known to us which have similar funicular segments are those of *T. retorridum* (Pinto et al., 1978).

The hosts of *T. australicum* are unknown. Reports of *T. australicum* in Java on various Lepidoptera eggs (e.g., Girault, 1914, 1915) are apparently based on a different species (Girault, 1922).

Since none of Girault's *T. australicum* specimens were reared, the conspecificity of variants and the sexes requires confirmation. Considering the magnitude of variation described above we feel that his original series probably represents more than one species.

Acknowledgments

We are thankful to E. C. Dahms, Senior Curator, Entomology, Queensland Museum, Queensland, Australia, for providing Girault's type specimens of *Trichogramma australicum*, and to Nancy A. Browning for preparing the illustrations.

Literature Cited

- Girault, A. A. 1912. Australian Hymenoptera Chalcidoidea—1. The family Trichogrammatidae with descriptions of new genera and species. Mem. Queensland Mus., 1:66–116.
- Girault, A. A. 1914. Notes on the Hymenoptera Trichogrammatidae and Mymaridae. Can. Entomol., 46:327–330.
- Girault, A. A. 1915. Australian Hymenoptera Chalcidoidea—I. Second Supplement. Mem. Queensland Mus., 3:142–153.
- Girault, A. A. 1922. New chalcid flies from Australia. The Entomologist, 55:205–208.
- Nagaraja, H., and S. Nagarkatti. 1973. A key to some New World species of *Trichogramma* (Hymenoptera: Trichogrammatidae), with descriptions of four new species. Proc. Entomol. Soc. Wash., 75:288–297.
- Nagarkatti, S., and H. Nagaraja. 1968. Biosystematic studies on *Trichogramma* species. I. Experimental hybridization between *Trichogramma australicum* Girault, *T. evanescens* Westwood and *T. minutum* Riley. Commonw. Inst. Biol. Control Tech. Bull., 10: 81–96.
- Nagarkatti, S., and H. Nagaraja. 1979. The status of *Trichogramma chilonis* Ishii (Hym.: Trichogrammatidae). Orient. Insects, 13(1–2):115–118.
- Pinto, J. D., G. R. Platner, and E. R. Oatman. 1978. Clarification of the identity of several common species of North American *Trichogramma* (Hymenoptera: Trichogrammatidae). Ann. Entomol. Soc. Amer., 71:169–180.
- Viggiani, G. 1976. Ricerche sugli Hymenoptera Chalcidoidea XLIX. *Trichogramma confusum* n. sp. per *T. australicum* Nagarkatti & Nagaraja (1968) nec Girault (1912), con note su Trichogrammatoidea Girault e descrizione di *Paratrachogramma heliothidis* n. sp. Boll. Lab. Entomol. Agr. "Filippo Silvestri" di Portici, 33:182–187.